

**REMARKS**

Claims 1-36 are pending in the application, claims 13-26 and 28-36 are withdrawn from consideration and claims 1-12 and 27 stand rejected.

**Claim Rejections - 35 U.S.C. § 112, Second Paragraph**

Claims 1-12 and 27 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter the application regards as the invention.

Specifically, the Examiner contends that the recitation “to cross a side opposite to said introduction port side with respect to said jet port” is not clear, particularly “a side” of what?

Applicants respectfully submit the present amendments to claims 1, 4, 11 and 27 as obviate this rejection.

**Claim Rejections - 35 U.S.C. § 103(a)**

Claims 1-6, 11-12 and 27 stand rejected under § 103(a) as being unpatentable over Perrin et al. (US 6,281,469) in view of Okui (JP 2001/109979). This rejection should be traversed for at least the following reasons.

In the rejection, the Examiner applies Perrin alleging it discloses most of the features recited in claims 1, 4, 11 and 27, but concedes Perrin fails to disclose each electrode being elongate in an extending direction and short in a short direction orthogonal to the extending direction or a conveyor that passes said workpiece through the outside of said discharge space under said pressure in the vicinity of atmospheric pressure in a direction intersecting with the extending and flowing directions so as to cross a side opposite to said introduction port side with respect to said jet port. (*Office Action*, p.7).

However, to compensate for these deficiencies, the Examiner applies Okui contending it discloses these missing features. As a reason to combine, the Examiner alleges:

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have combined '979 with '469. Specifically, to have replaced the stationary substrate (for example, Fig. 21) with a conveyor as taught in Fig. 3 of '979 and to have changed the shape of the electrode to rectangular, using Fig. 7 as a guide to arrange electrode in an extending direction, for the purpose of achieving continuous coating and uniformity (979, [0004] line 4), with a reasonable expectation of success.

(*Office Action*, p. 8).

In response, Applicants respectfully submit that the Examiner's proffered reason to combine is invalid. Particularly, "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." (MPEP § 2143.01 (VI); *citing* In re Ratti, 270 F.2d 810). Here, Applicants submit that Perrin is directed to a non-conveyed area type capacitively coupled RF plasma reactor. Consequently, modifying the device of Perrin to utilize "a conveyor that relatively passes said workpiece through outside of said discharge space under said pressure in the vicinity of atmospheric pressure in a direction intersecting with the extending and flowing directions during the jetting of the plasmatized gas." would change the principle of operation of Perrin.

First, Perrin utilizes a sub-electrode pattern with two-dimensionally arrayed sub-electrode squares. (*see* FIG. 15, reproduced below). These sub-electrodes 12 are grouped periodically in two groups A and B. (col. 6, lines 17-20).

Perrin electrically operates these two groups A and B so as to alternate periodically. (col. 2, lines 52-55). Further, when using this technique, Perrin discloses the use of a plasma reaction volume 3 confined by two electrode arrangements 10 and 20, wherein the arrangement depicted

in FIG. 15 corresponds to the electrode arrangement 10. Using this electrode arrangement, mutually different RF signal amplitudes and/or phasing and/or frequencies and/or voltage-shapes interact with the reaction volume to result in an “averaged” effect on the workpiece. (col.3, lines 5-9).

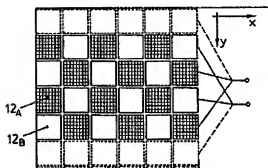


FIG.15

To accomplish this, Perrin discloses that the distance between two sub-sequent sub-electrodes belonging to the same group should be of the order less than the extent of the plasma gap (PG in FIG. 7). This results in the workpiece being subjected to an “averaged” effect of several plasma columns operated between respective sub-electrodes and the electrode arrangement 20. (col. 6, lines 20-27). Thus, the electrodes are operated with alternating effect (12A and 12B) over a period of time to provide an average effect on the workpiece. This implies that the workpiece must itself be stationary to absorb the “averaged” effect.

Further, in order to adjust to workpieces of various sizes, Perrin discloses that the electrode design can be extended. (col. 7, lines 29-33). In this way, Perrin relies on a specific electrode structure to encompass a reaction volume to treat the workpiece.

Consequently, Applicants submit that modifying Perrin to incorporate the conveyor of Okui as suggested by the Examiner would change the principle of operation of Perrin. Thus, Applicants submit that one of ordinary skill in the art would not modify Perrin to use a conveying system as shown in Okui.

Further, even if Perrin could be modified to use such a conveyance system, Applicants submit there would be no basis for maintaining the electrode arrangement of FIG. 15 which is relied upon by the Examiner as disclosing the recited “one of said electrode members of said first electrode row and one of said electrode members of said second electrode rows, which are arranged in substantially same positions in the extending direction, having opposite polarities and forming a row-to-row partial gap therebetween, said row-to-row partial gap serving as a part of said discharge space, one of said polarities being an electric field applying pole, the other of said polarities being a grounding pole.”

Thus, Applicants submit the Examiner has failed to establish *prima facie* obviousness because one of ordinary skill in the art would not combined Okui’s conveyance system with the RF reactor of Perrin as suggested by the Examiner. Thus, Applicants submit claims 1, 4, 11 and 27 are allowable for at least this reason. Additionally, Applicants submit claims 2-3, 5-6, and 12 are allowable, at least by virtue of their dependency.

Additionally, even if combined as suggested, Applicants submit Perrin fails to disclose “a first electrode row including a plurality of electrode members each being elongate in an extending direction and short in a short direction orthogonal to the extending direction and arranged in a line in the extending direction,” and “an introduction port of the processing gas communicated with a side in a flowing direction orthogonal to the extending and short directions, as recited in claim 1.

In the Response to Arguments section of this Office Action, the Examiner contends:

Perrin does teach “elongate” and “arranged in a line” in the extending direction, as shown in Fig. 7. (*Office Action*, p. 12).

However, as indicated in the Office Action, the Examiner relies on item 23 of FIG. 20 as disclosing the recited jet port. Further, the flow through this jet portion would be in the z-direction of FIG. 7. As the short direction and the extending direction are both orthogonal to the flowing direction, these directions must correspond to the x and y directions, respectively. However, because FIG. 7 fails to disclose any dimension of the electrodes in the y-direction, this figure fails to disclose “a plurality of electrode members each being elongate in an extending direction and short in a short direction orthogonal to the extending direction” as recited in claim 1.

Moreover, assuming the Examiner would attempt to rely on FIG. 14 as disclosing this feature, Applicants submit this particular embodiment fails to disclose a first electrode row including a plurality of electrode members. Rather, this embodiment only shows a single electrode member in each row.

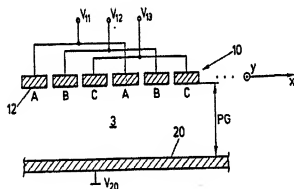


FIG.7

Additionally, the Examiner takes official notice that it is common knowledge to arrange electrodes in the length-wise direction for the purpose to extend the electrodes or objects. In response Applicants submit that the

Examiner's use of official notice here is improper. MPEP § 2144.03 (B) requires that if Official Notice is taken of a fact unsupported by documentary evidence, the Examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. Here, the Examiner merely concludes, absent any reasoning, it is common knowledge to arrange electrodes in the lengthwise direction.

Accordingly, because the Examiner has failed to provide the required reasoning, Applicants submit the Official Notice is improper.

Thus, Applicants submit claim 1 is allowable for this additional reason. Also, Applicants submit that because claims 4, 11 and 27 disclose features similar to those set forth above with regard to claim 1, claims 4, 11 and 27 are allowable for the same reasons set forth above. Additionally, Applicants submit claims 2-3, 5-6 and 12 are allowable, at least by virtue of their dependency.

**Claim Rejections - 35 U.S.C. § 103(a)**

Claims 7-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Perrin in view of Okui, further in view of Koga et al. (US 6,518,990). This rejection should be traversed for at least the following reasons.

First, Applicants submit that because Koga fails to compensate for the above noted deficiencies of the Perrin / Okui combination as applied to claims 1 and 4, claims 7-10 are allowable, at least by virtue of their dependencies.

Additionally, Applicants also submit that one of ordinary skill in the art would not modify either Perrin or Okui based on the electrodes of Koga. In particular, the electrodes 3b of Koga do not function to form plasma, but rather are in contact with a late image carrier 2 to write an electrostatic image. Consequently, in view of the different functions performed by the electrodes in Perrin as compared with the electrodes of Koga, the Examiner's reasons to combined which suggested one of skill would incorporate Koga's electrode array into Perrin's plasma reactor is wholly unsupported. Specifically, Koga fails to provide any guidance with respect to the use of electrodes in an RF-plasma reactor.

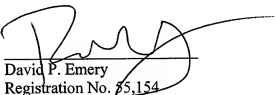
Thus, Applicants submit that as the Examiner has failed to provide a rational reason to combine Koga with either Perrin or Okui, no *prima facie* case of obviousness has been established. Thus, Applicants submit claims 7-10 are allowable for this additional reason.

**Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

  
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